

MAYFLOWER TAILINGS STUDY

SCHEDULE

DESCRIPTION	WEEKS															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FINAL APPROVAL OF WORK PLAN																
HYDROGEOLOGIC INVESTIGATION																
INSTALLATION OF MONITOR WELLS																
DEVELOP AND SLUG TEST WELLS																
SURVEYING																
WATER SAMPLING																
LABORATORY TESTING																
FORWARD DATA TO DELFT																
REPORT																
GEOTECHNICAL INVESTIGATION																
SITE RECONNAISSANCE																
FIELD INVESTIGATION																
LABORATORY TESTING																
ENGINEERING ANALYSIS																
EVALUATE DESIGN ALTERNATIVES																
COST ESTIMATES																

FINAL APPROVAL OF WORK PLAN

HYDROGEOLOGIC INVESTIGATION

INSTALLATION OF MONITOR WELLS



DEVELOP AND SLUG TEST WELLS



SURVEYING



WATER SAMPLING



LABORATORY TESTING



FORWARD DATA TO DELFT



REPORT



GEOTECHNICAL INVESTIGATION

SITE RECONNAISSANCE



FIELD INVESTIGATION



LABORATORY TESTING



ENGINEERING ANALYSIS



EVALUATE DESIGN ALTERNATIVES



COST ESTIMATES



SUMMARY REPORT



MAYFLOWER TAILINGS STUDY SCHEDULE

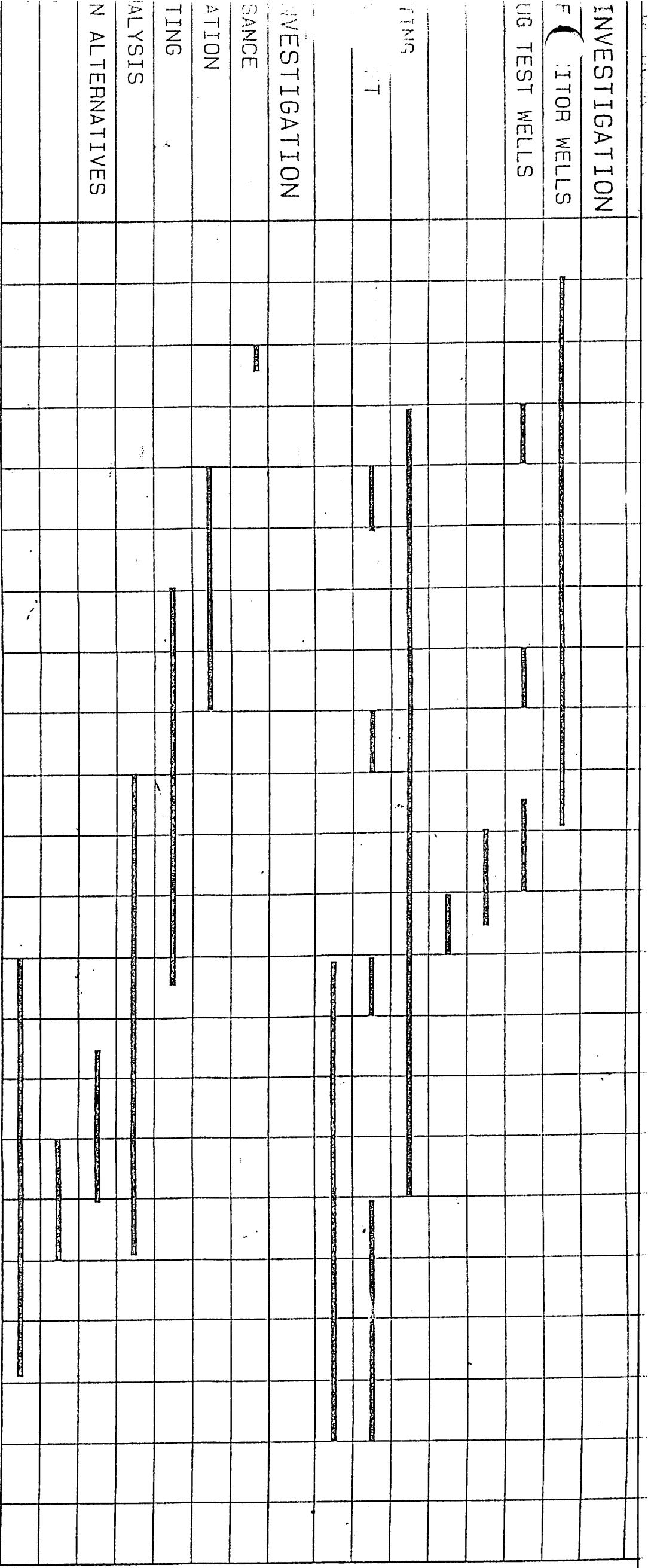
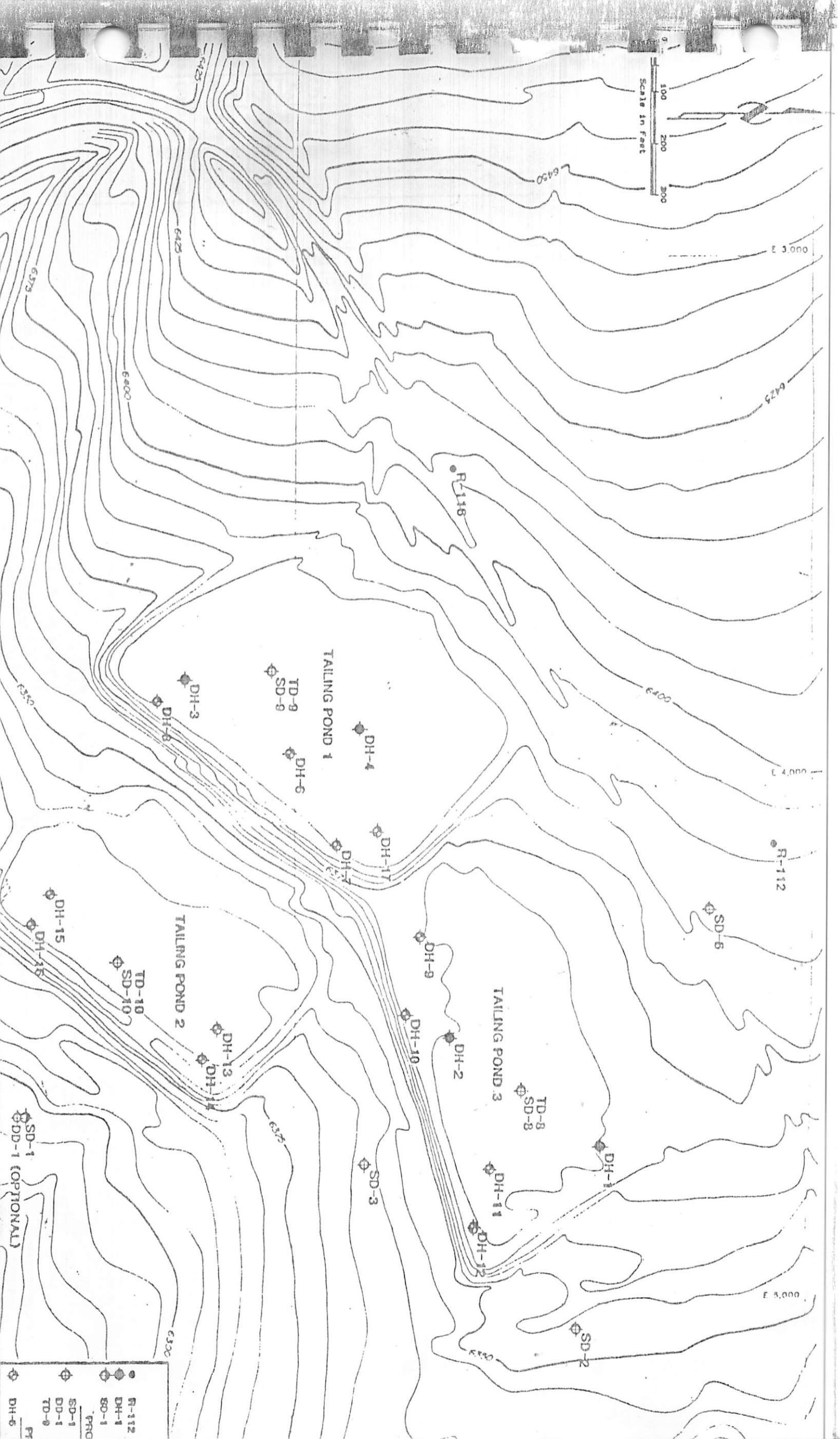
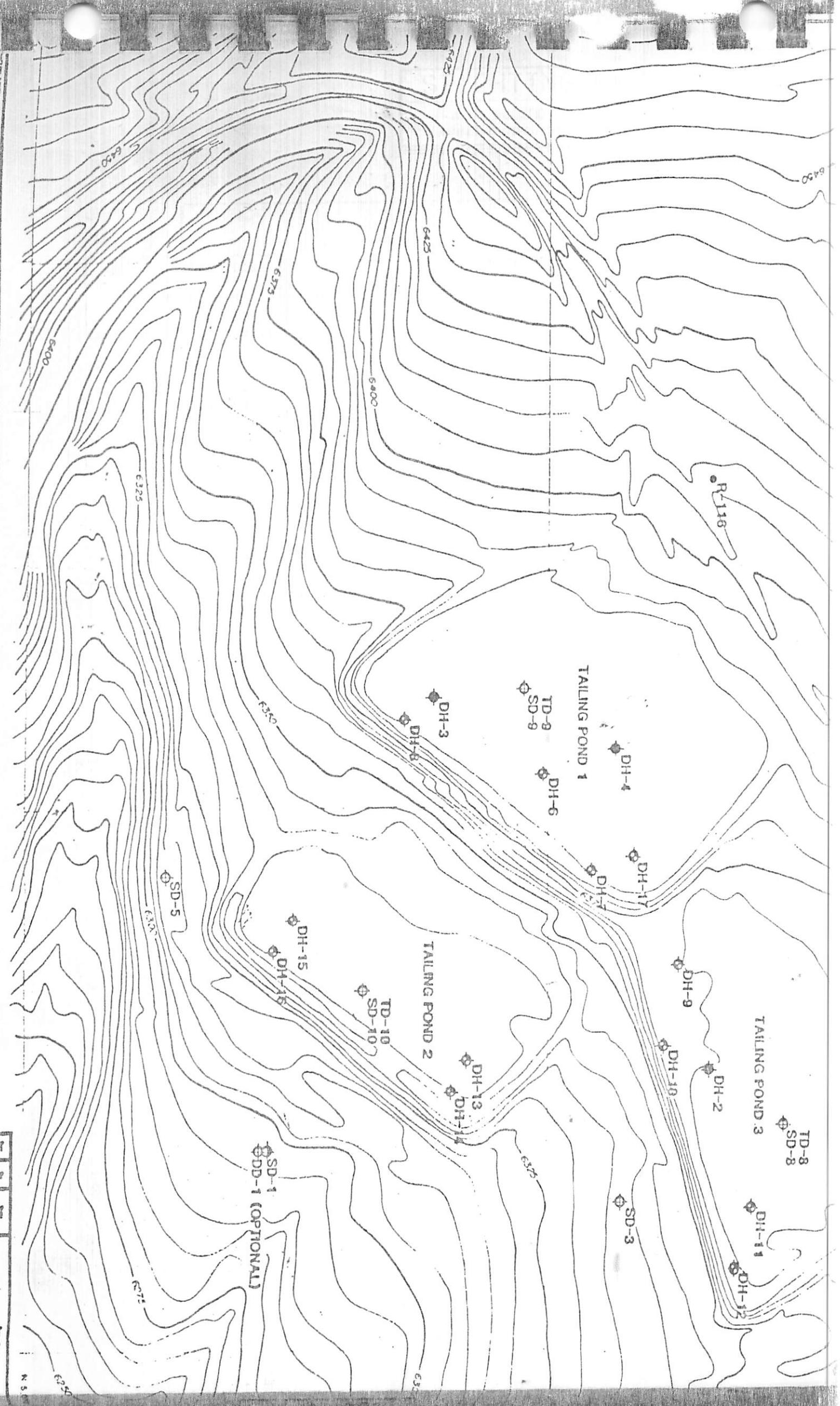
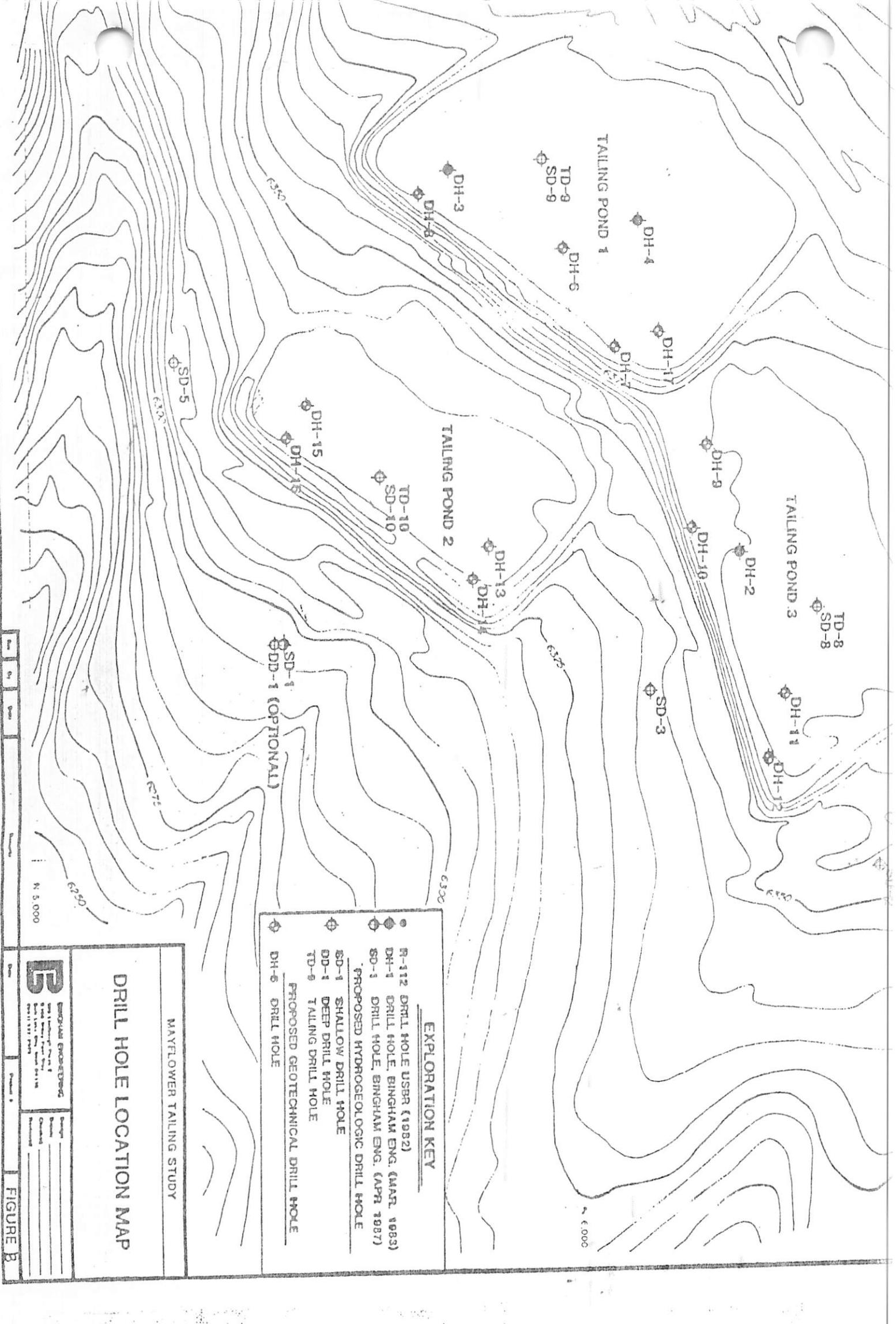
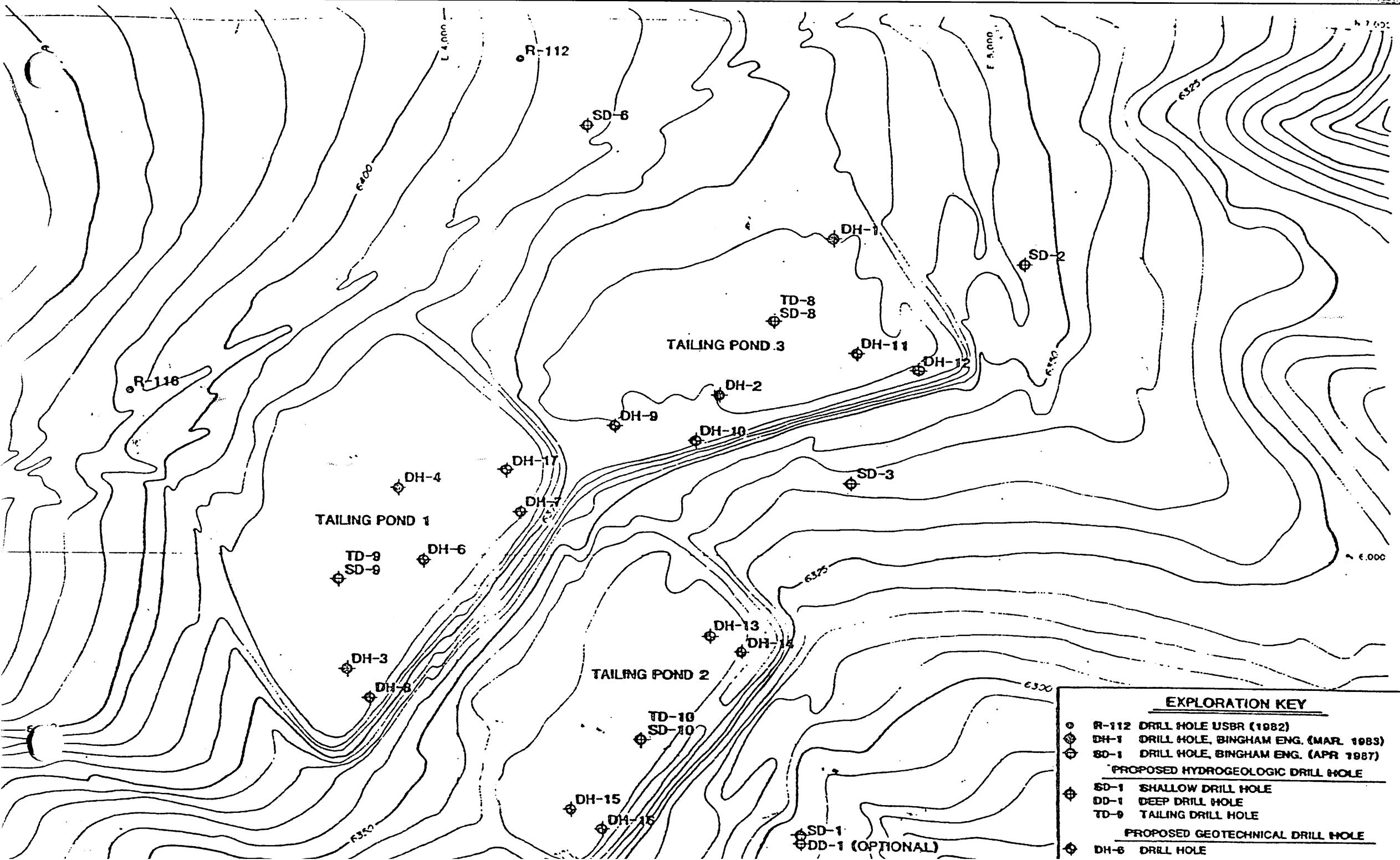


FIGURE D



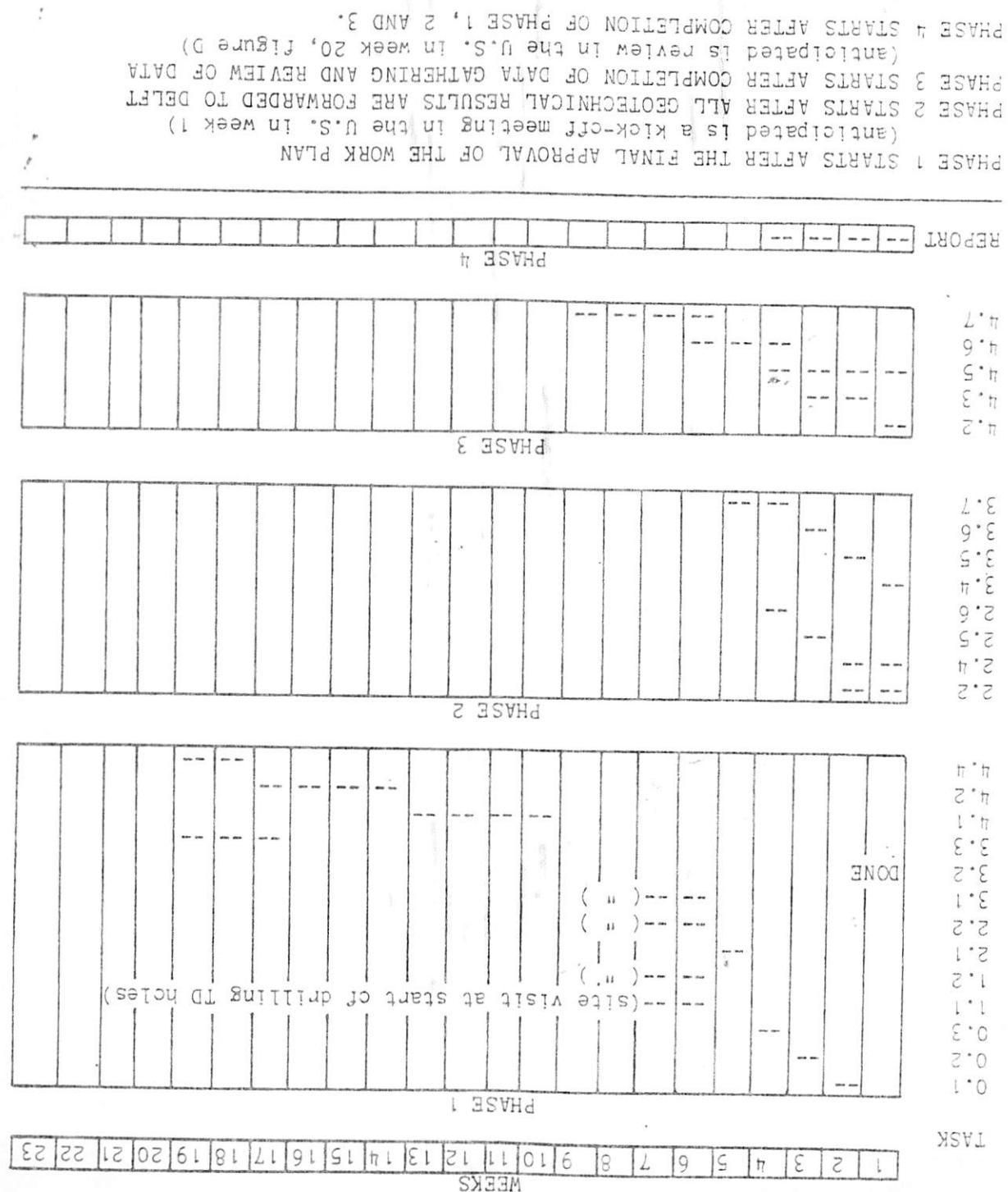






EXPLORATION KEY

- R-112 DRILL HOLE USBR (1982)
- DH-1 DRILL HOLE, BINGHAM ENG. (MAR 1983)
- SD-1 DRILL HOLE, BINGHAM ENG. (APR 1987)
- PROPOSED HYDROGEOLOGIC DRILL HOLE
- SD-1 SHALLOW DRILL HOLE
- DD-1 DEEP DRILL HOLE
- TD-9 TAILING DRILL HOLE
- PROPOSED GEOTECHNICAL DRILL HOLE
- DH-6 DRILL HOLE



PHASE 1 STARTS AFTER THE FINAL APPROVAL OF THE WORK PLAN
 (anticipate is a kick-off meeting in the U.S. in week 1)
 PHASE 2 STARTS AFTER ALL GEOTECHNICAL RESULTS ARE FORWARDED TO DELFT
 (anticipate is a kick-off meeting in the U.S. in week 1)
 PHASE 3 STARTS AFTER COMPLETION OF DATA GATHERING AND REVIEW OF DATA
 (anticipate is reviewed in the U.S. in week 20, figure D)
 PHASE 4 STARTS AFTER COMPLETION OF PHASE 1, 2 AND 3.

PROFESSIONAL RECORD
CLARK M. MOWER

POSITION: Vice President

YEARS WITH FIRM: 10

DATE OF BIRTH: November 22, 1946

PROJECT ASSIGNMENT: Principal-in-Charge

EXPERIENCE SUMMARY

Mr. Mower's experience has been in the planning and development of projects needing special consideration in water supply, governmental approvals and environmental concerns. He has worked closely with city, county and state agencies in the approval process of projects designed and engineered under his direction.

Mr. Mower has also worked extensively with water rights where he has analyzed appropriations, use data, supply and distribution systems and prepared for and appeared as a witness in many water rights actions in court cases.

He has been involved in the White River Oil Shale Alternative Water Sources Studies, White River Dam and Hydroelectric Project, Project Manager for the Water Alternatives Study for the Paraho - Ute Project, all of the Bountiful City Power and Light Hydroelectric Projects, Elberta Farms Irrigation Study.

He has been responsible for the preparation of Environmental Impact Statements on numerous hydroelectric and development projects and has coordinated their preparation and approval with the various agencies.

Mr. Mower has served as Project Manager on large development projects in Salt Lake, Weber, Summit, Utah and Wasatch Counties, Utah and other surrounding states.

He is currently serving as Project Manager for the Mayflower Recreational Project, a 2556 unit development in Wasatch and Summit Counties, Utah.

He has worked closely with the Utah Department of Transportation, U.S.D.I., Bureau of Reclamation and all of the major utility companies in planning for and evaluating this Development's impact on the surrounding community and governmental agencies.

He has also been involved in Master Plan and environmental preparation and review of the Spring Creek, Blue Ridge, Silver Summit and Bertagnole developments, all of which lie in the immediate proximity of the proposed project.

WILLIAM R. HIGHLAND

Position: Consultant
Education: B.S. Geology, minor in Civil Engineering - with honors, 1973,
University of Illinois
M.S. Hydrogeology - 1975, University of Minnesota
PhD Course Work, Hydrogeology - 1976-77 University of Illinois
Registration: P.E., Utah, Colorado, Minnesota, New Mexico

EXPERIENCE RECORD

Highland Associates

Principal (1984 to date, Utah, Colorado). Since establishing Highland Associates, Mr Highland has been responsible for conducting activities such as:

- o design of a groundwater cut-off well and collection system
- o ground water monitoring system design at hazardous waste sites
- o ground water contamination assessments at hazardous waste sites including geophysical surveys, pumping tests, water quality analyses, and ground water flow and contaminant transport modeling
- o design of hazardous waste site closure plans
- o technical and economic feasibility evaluations of closure and remedial action alternatives including cut-off walls, recovery wells, drains, liners and covers
- o alternate concentration limit petition documents (RCRA ground water monitoring variance petition)

Dames & Moore

Senior Hydrologist (1980 - 1984, Salt Lake City & Perth, Australia)

- o devised and directed geochemical laboratory investigations of clay liner performance in contact with acidic and caustic process fluids
- o site investigations including geophysical logging, pump tests, packer tests, borrow material investigations and water quality testing
- o design of mine dewatering systems
- o development and application of ground water contaminant transport models
- o economic and technical feasibility studies for locating waste disposal sites

Barr Engineering Company

Project Hydrologist/Geotechnical Engineer (1975 - 1980, Minneapolis)

- o resident engineer, tailing dam construction
- o dam foundation and barrow area investigations
- o dam design including slope stability analyses, hydrologic and flood routing analyses, design of underdrains and design of well depressurization systems

WILLIAM R. HIGHLAND, page 2

- o ground water contamination assessments
- o design of large municipal water supply wells
- o economic and technical feasibility evaluations of alternate water supply schemes
- o ground water flow and contaminant transport modeling
- o HUD flood plane delineation studies
- o designed and inspected a grouting program for a tailings pond decant line

EXPERIENCE SUMMARY:

Lead Ground Water Hydrologist

1984 - 1986 Kennecott Bingham Canyon Groundwater Barrier (Utah)
 Utah International Alton Coal Project (Utah)
 Amoco Hazardous Waste Facilities (Salt Lake City)
 Chevron Refinery (Salt Lake City)
 Husky Refinery (Salt Lake City)
 Husky Refinery (Wyoming)

1982 - 1984 Western Mining Corp. Baldivis Tailing Pond (W. Australia)
 Leigh Creek Coal Mine (S. Australia)
 Semirara Coal Mine (Philippines)
 ARCO Gelliondale Coal Property (Vic., Australia)
 Alcoa Alumina Tailings Pond (W. Australia)
 State Electricity Commission Ash Disposal Pit (W. Australia)

Senior Hydrologist

1980 - 1982 F.A.P. Uranium Tailing Disposal and Evaporation Ponds (Wy.)
 Anaconda Bluewater Mill Uranium Tailing Disposal (New Mexico)
 Exxon Highlands Uranium Mine (Wyoming)
 Amoco Mandan Refinery (North Dakota)
 Kennecott McGill Tailing (Nevada)

Project Hydrologist/Geotechnical Engineer

1975 - 1980 Northern States Power SHERCO Ash Disposal Pond (Minnesota)
 Hibbing Taconite Tailing Dam (Minnesota)
 AMAX Lead Tailing Dam (Missouri)
 Eveleth Taconite Tailing Dam (Minnesota)
 Reilly Tar and Chemical Creosote Plant (Minnesota)
 Reserve Mining Tailings Facility (Minnesota)
 City of Bloomington Water Supply Well (Minnesota)
 City of Moorehead Water Supply System (Minnesota)

CONTINUING EDUCATION

Structural Engineering I & II, University of Minnesota 1978
Advances in Computer Graphics for CAD and CADD, U. of Minnesota 1979
Design and Construction of Tailing Dams, Colorado State University 1979

CURRICULUM VITAE

Name: LOXHAM

First names: M.

Year of birth: 1946

Nationality: Dutch

Languages: English, Dutch, French

Education:

1967 University of Leicester (England) B.Sc. Chemistry
1972 Delft University of Technology (Netherlands) M.Sc. (cum laudum) Chemical Engineering
1976 Delft University of Technology (Netherlands) Dr. Theoretical Fluid Dynamics
1981 Delft University of Technology (Netherlands) Post Graduate Studies in Environmental Science
1982 Eindhoven Technical University (Netherlands) Post Graduate Studies in Statistics.

Experience:

1978 Delft Soil Mechanics Laboratory
Head of Environmental Geotechnical Unit of the Laboratory with broad responsibilities for both the technical and financial aspects of the groups work.
Special interests include high and low level radioactive waste management research programs and the technical response to hazardous waste problems.
Post Graduate Lecturer on Soil Sampling and Mathematical Modelling for Soil Pollution Studies.

1975 Exxon Chemicals
Plant Engineer for the Rotterdam Nitric Acid and Urea Plants, responsible for the technical efficiency of the units

1971 Delft University of Technology
Staff member of the Chemical Engineering Department responsible for Post Graduate Research Programs in Heat and Mass Transfer.

1969 Newell Dunford Engineering Ltd.
Research Manager charged with the development of heavy manufacturing equipment for making light weight aggregate from quarry wastes.

1967 Associated Portland Cement Ltd.
Management trainee and Production Engineer on a large Cement Manufacturing Facility.

Publications.

Loxham M. (1971) "Grinding Coke in Rod Mills", Chemical and Process Engineering, 45-49.

Loxham M. (1971) "Specifying Calcination Plant", Chemical and Process Engineering, 59-60.

Loxham M. & Heertjes P.M. (1974) "Aspects of Two Phase Flow in the Exit Pipe of a Gas Cyclone", 1st European Conference on Mixing and Centrifugal Separation, Cambridge England, 9-11 Sept.

Loxham M. & Heertjes P.M. (1975) "Thin Film Model for the Laminar Flow of a Liquid on the Inside Wall of the Exit Pipe of a Gas Cyclone", Trans Instn. Chem. Engrs. (53) 187-190.

Loxham M. (1976) "Flow Patterns in the Exit Pipe of Cyclone", (Doctors Thesis) T.H. Delft.

Loxham M. (1980) "Theoretical Considerations of the Transport of Pollutants in Peats", 6th International Peat Conference Duluth 600-606.

Loxham M. (1980) "The influence of Soil Heterogeneity on Modeling Transport Processes in the Ground", Institutskolloquium, Inst. für Strahlenschutz, München (W. Germany) 26th November.

Burghardt W. & Loxham M. (1981) "Der Einfluss der Porenraumgliederung auf den Transport gelöster Stoffe in Torfen" Mitteilgn. Dtsch Bodenkundl. Gesellsch. (39) 149-158.

Loxham M. (1981) "Some Aspects of the Use of Organic Soils in Pollution Control Strategies", International Environment & Safety Conference, London September 2-4.

Loxham M. & Barends F. (1981) "The Influence of Soil Heterogeneity on the Simulation of the Development of Groundwater Quality", International Ground Water Symp. Noordwijkerhout, The Netherlands.

Loxham M. (1981) "Pollution in Peats", 10th Int. Conf. Soil Mechanics and Foundation Engineering Stockholm, Paper 6/10.

Loxham M. (1982) "Transport Phenomina in Heterogeneous Media". Symp. Modern Developments in Foundation Engineering, Delft.

Loxham M. (1982) "Geotechnische Oplossingen voor Bodemverontreiniging, een Methodologie", Symp. Grondmechanica & Bodemsanering, KIVI Delft, 31-36.

Loxham M. (1982) "The Significance of Various Factors in the Simulation of Pollution Dispersion in Real Soils", Int. Environmental and Safety Conference, London.

Weststrate F., Loxham M. & Schotting R. (1983) "The use of Cement-Bentonite Screens in Pollution Control", International Environment Conference London, June.